UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/474,715	12/29/1999	RICHARD AUFRICHTIG	15-XZ-4974-(	2623

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EXAMINER
DASTOURI, MEHRDAD

ART UNIT	PAPER NUMBER
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 09/474,715	Applicant(s) AUFRICHTIG ET AL.
	Examiner Mehrdad Dastouri	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 August 2003_ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-43_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-43_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

Response to Amendment

1.   Applicants' amendment filed August 7, 2003, has been entered and made of

record.

2.   Applicants' arguments filed August 7, 2003 have been fully considered but they

are not persuasive.

Applicants argue in essence that prior art of record (Granfors et al.) does not

teach Claim 1 limitation concerning using a local gradient as a basis of a correction

value which is provided to correct a defective pixel.

The Examiner disagrees and indicates Claim 1 broadly recites, "Providing a

correction value based on the local gradient to correct the defective pixel". It is

respectfully submitted that "gradient" is a change in the value of a quantity with respect

to the change in a given variable. For digital images the quantity is the intensity of the

pixels and the given variable is the location of the pixels. Claim 1 does not recite a

specific gradient filter.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1-3, 5, 8-12, 14, 17-21, 23, 26-31, 33 and 36 are rejected under 35

U.S.C. 102(b) as being anticipated by Granfors et al (U.S. 5,657,400).

Regarding Claim 1, Granfors et al disclose a method for correcting a defective

pixel in an image produced by a detector, the image including an array of pixels and the

array of pixels having a corresponding array of pixel values, comprising:

(a) determining a local gradient, the local gradient comprising an array of local

gradient matrix elements (Column 3, Lines 65-67, Column 4, Lines 1-11. A digital

image is an array of pixels having the pixel intensities as a corresponding array of pixel

values. The local gradient matrix is generated from the convolution of the filter kernel

and the array of the image pixel values.); and

(b) providing a correction value based on the local gradient to correct the

defective pixel (Figure 3; Column 4, Lines 12-53).

Regarding Claim 2, Granfors et al further disclose the method of Claim 1,

wherein step (a) of determining a local gradient includes determining the local gradient

in part from a gradient kernel and at least a portion of the array of pixel values (Column

3, Lines 65-67, Column 4, Lines 1-11).

Regarding Claim 3, Granfors et al further disclose the method of Claim 2,

wherein the at least a portion of the array of pixel values comprises a matrix, and

includes the defective pixel as a center matrix element and a surrounding neighboring

pixels of the defective pixel as remaining matrix elements (Figure 3, Pixel 34; Column 4,

Lines 38-53).

Regarding Claim 5, Granfors et al further disclose the method of Claim 1,

wherein step (b) of providing a correction value includes at least one of a linear

interpolation and a weighted average of pixel values corresponding to the highest local

gradient matrix elements (Column 4, Lines 24-53).

Regarding Claim 8, Granfors et al further disclose the method of Claim 1, further comprising:

identifying the defective pixel in the image produced by the detector before the determining step (a) (Column 4, Lines 54-55);

replacing temporarily the defective pixel with a linear interpolation of a surrounding neighborhood pixels before the determining step (a) (Column 4, Lines 55-65); and

replacing the defective pixel with the correction value after the providing step (b) (Column 4, Lines 66-67, Column 5, Lines1-7).

Regarding Claim 9, Granfors et al further disclose the method of Claim 1, further comprising repeating steps (a)-(b) a plurality of times as desired to correct a plurality of defective pixels in the image produced by the detector (Column 4, Lines 12-23).

With regards to Claims 10, 19 and 29, arguments analogous to those presented for Claim 1 are applicable to Claims 10, 19 and 29.

With regards to Claims 11, 20 and 30, arguments analogous to those presented for Claim 2 are applicable to Claims 11, 20 and 30.

With regards to Claims 12, 21 and 31, arguments analogous to those presented for Claim 3 are applicable to Claims 12, 21 and 31.

With regards to Claims 14, 23 and 33, arguments analogous to those presented for Claim 5 are applicable to Claims 14, 23 and 33.

Regarding Claim 17, Granfors et al further disclose the method of Claim 10, wherein the detector comprises an array of photodetector elements, each photodetector

element configured to convert an impinging photonic energy into an electrical signal proportional thereto (Figure 2B; Column 2, Lines 49-67).

With regards to Claim 18, arguments analogous to those presented for Claim 9 are applicable to Claim 18.

Regarding Claim 26, Granfors et al further disclose the system of Claim 19, wherein the means for determining and the means for providing include determining the local gradient and generating the correction value, respectively, for each of a plurality of defective pixels in the image produced by the detector (Column 4, Lines 12-65).

With regards to Claim 27, arguments analogous to those presented for Claim 19 are applicable to Claim 27.

Regarding Claim 28, Granfors et al further disclose the system of Claim 27, wherein the means for replacing includes at least one of replacing the defective pixel with the correction value, and storing the correction value with an identifying link to the defective pixel in a storage device (Column 4, Lines 54-65).

With regards to Claim 36, arguments analogous to those presented for Claim 8 are applicable to Claim 36.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 4, 13, 22, 32, 37-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granfors et al (U.S. 5,657,400).

Regarding Claim 4, Granfors et al further disclose the method of Claim 2, further

comprising:

selecting a matrix size of the at least a portion of the array of pixel values

(Portion of the digital image corresponding to array of elements 22 shown on Figure

2B); and

selecting the gradient kernel (Column 4, Lines 1-5).

Granfors et al do not explicitly disclose the gradient filter is selected from a group

including a Laplacian of a Gaussian filter kernel, a Roberts gradient kernel, a Prewitt

gradient kernel, and a Sobel gradient kernel.

Laplacian of a Gaussian filter kernel, Roberts gradient kernel, Prewitt gradient

kernel, and Sobel gradient kernel are well known filters conventionally implemented in

image processing for filtering images (Official Notice).

It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to select the gradient kernel from a group including a Laplacian of a

Gaussian filter kernel, a Roberts gradient kernel, a Prewitt gradient kernel, and a Sobel

gradient kernel because these are the well known filter kernels conventionally utilized in

image processing for filtering purposes to detect and enhance the edges in digital

images.

With regards to Claims 13, 22 and 32, arguments analogous to those presented

for Claim 4 are applicable to Claims 13, 22 and 32.

With regards to Claim 37, arguments analogous to those presented for Claim 1

are applicable to Claim 37. Global characteristic is the gradient of the pixels.

With regards to Claims 39 and 40, arguments analogous to those presented for Claim 1 are applicable to Claims 39 and 40.

With regards to Claims 38 and 41-43, 5 x 5 and 7 x 7 filter kernels are well known filters conventionally implemented in image processing for filtering images (Official Notice).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to select the 5 x 5 and 7 x 7 gradient kernels because these are the well known filter kernels conventionally utilized in image processing for filtering purposes to detect and enhance the features in digital images.

7.   Claims 6, 7, 15, 16, 24, 25, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granfors et al (U.S. 5,657,400) in view of Graham et al (U.S. 5,821,915).

Regarding Claim 6, Granfors et al do not explicitly disclose the method of Claim 5, wherein the highest local gradient matrix elements include at least three highest local gradient matrix elements.

Graham et al disclose a method for removing artifacts from scanned halftone images utilizing highest local gradient matrix elements including at least three highest local gradient matrix elements (Figures 6-10; Columns 7-8, Column 9, Lines 1-14).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize highest local gradient matrix elements including at least three highest local gradient matrix elements because it will increase the accuracy of the detecting defective pixels.

With regards to Claims 15, 24 and 34, arguments analogous to those presented for Claim 6 are applicable to Claims 15, 24 and 34.

Regarding Claim 7, Granfors et al do not explicitly disclose the method of Claim 5, wherein the weighted average of pixel values corresponding to the highest local gradient matrix elements include giving greater weight to pixel values proximate to the defective pixel.

Graham et al disclose a method for removing artifacts from scanned halftone images wherein the weighted average of pixel values corresponding to the highest local gradient matrix elements include giving greater weight to pixel values proximate to the defective pixel (Figure 4; Column 10, Lines 12-51).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to give greater weight to pixel values proximate to the defective pixel because it will increase the accuracy of the detecting defective pixels.

With regards to Claims 16, 25 and 35, arguments analogous to those presented for Claim 7 are applicable to Claims 16, 25 and 35.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact Information

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Mehrdad Dastouri whose telephone number is (703)

305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m.

to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 872-9406 for

regular communications and (703) 872-9406 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the technology Center Customer Service Office whose

telephone number is (703) 306-0377.

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
October 17, 2003